Amendments to the Specification:

Please replace paragraph [0028], with the following amended paragraph:

[0028]   In one embodiment, the MMD 20 comprises a plurality of digital input connectors 50, a plurality of analog input connectors 55, a plurality of serial RS232 ports 65, one software selectable serial RS232/RS485 port 65, and a plurality of digital output connectors 75. Configuration information is stored in the read/write flash memory 100, which allows for preservation of configuration information in the event of a power failure. A long-life battery ~~120~~ 125 functions as a power back-up mechanism and ensures that the MMD 20 can continue functioning in the event of such a failure. The MMD 20 reads and stores other useful data via ROM 105 and RAM 110, or disk storage 115. Should connections to the network 25 cease to function, this data can be forwarded on to a CD 35 when network 25 connections are re-established. Thus, the MMD 20 may retain its configuration information and continue temporarily to monitor the machine 15, without data loss, even in the event of a power or network 25 failure. The MMD 20 also includes a plurality of MMD LEDs 120 for indicating the status of the input voltage, digital input connectors 50, digital output connectors 75, COM1 serial (RS232/RS485) port 65, and network connectivity via the Ethernet port 85. The Ethernet port 85 may also be used to communicate with machines 15 capable of Ethernet communications. Other than a CD 35, machines 15 capable of Ethernet communications will often not be directly attached to the MMD 20. Rather, they will communicate with the MMD 20 over the network 25. As one skilled in the art will recognize, however, other combinations for use of memory, battery ~~180~~ 125 backup capability, input connectors 45, output connectors 70, serial ports 60, network ports 80, and use of LEDs 120 are possible.

Please replace paragraph [0030], with the following amended paragraph:

[0030]   In brief, the software modules are comprised of ~~then~~ the following: a configuration interface module 135 for managing configuration information, an engine 140 for performing transformations on machine inputs and generating outputs based on the machine inputs, a database system 145 for storing report data, drivers 150 for translating machine inputs to a format useable by the engine and engine outputs for use by machines, a reports CGI module 155 and reporter module 160 which generate reports, and a web server 165 or the like for generating user interfaces for requesting and viewing reports and for entering and viewing configuration information, as well as handling all input from the user interfaces. The reports CGI module 155 is comprised within the web server 165 and specifically handles all user requests for reports and outputs the reports in the form of web page user interfaces. The web server further comprises a configuration CGI module 170 which specifically handles generation of web page user interfaces for entering and viewing configuration information. The database system 145 is further comprised of a database manager 175 and a database 180. The database manager 175 reads and writes data to the database 180 which stores the actual information required for report generation. These modules are explained in greater detail below.

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Please replace paragraph [0032], with the following amended paragraph:

[0032] The configuration interface module 135 is the only module that can read or write to the flash memory 100 that contains the configuration information. Thus, the configuration interface module 135 is used for reading and writing of configuration information for the MMD 20 to the flash memory 100 during the initial MMD 20 configuration and after configuration changes. As such, the configuration interface module 135 interacts with the configuration CGI module 170, which generates the web page interface through which the user enters and views configuration information on the CD 35. The configuration CGI module 170 transmits configuration information entered by the user to the configuration interface module 135, which then writes this information to the flash memory <u>100</u>. In addition, the configuration interface module 135 also supplies all necessary configuration information, by reading from the flash memory 100, to all other modules after configuration changes or during MMD 20 initialization. The other modules receive this information during initialization and store it in memory for subsequent use. Thus, once the other modules have been initialized with the configuration information, the configuration interface module 135 does not need to provide this information again unless there is a change in configuration or system re-start, such as after a power failure, etc. By using the configuration interface module 135 as an intermediary between all other modules and the configuration information stored in the flash memory 100, the MMD 20 ensures that each module is furnished with the configuration information required for the module's tasks and that only one module accesses the configuration information in the flash memory 100 at any given moment.

Please replace paragraph [0034], with the following amended paragraph:

[0034] The engine 140 monitors machine inputs via the drivers 150 for changes to determine whether the value received for a given input is <u>not</u> the same as the previous value received for that input, in which case an input change is detected. More specifically, the drivers 150 receive the inputs from the digital input connectors 50, analog input connectors 55, and serial RS232/RS285 ports 65 and translate them into a format useable by the engine 140. For each input, there is a variable associated with the input's value. The engine 140 compares the last value received for each input, as contained in the variable associated with the input, with the current value of the input.

Please replace paragraph [0042], with the following amended paragraph:

[0042] The exact contents and structure of the database 180 are dependent on the data inputs from the machine 15, the transformations and report variable changes resulting from treatment by the engine 140, and the database 180 structure. The database structure is based on the report variables which must be stored so as to be entered as in fields or displayed as graphs in the desired reports as set out in the configuration information. The database manager 175 establishes the database 180 structure, in accordance with this configuration information, and reads and writes records and fields of the database 180 in accordance with this structure. The configuration information is transmitted to the database manager 175 by the

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configuration interface module 135 upon initialization of the database manager 175 after powering up the MMD 20 or after a configuration change. For each report specified in the configuration information, there is a corresponding table in the database 180. Each report variable, as established in the report configuration information, constitutes a field within each record of the table assigned to that report. Each record within a table captures all of the values for the report variables required for the record as well as the time at which these variables held that value. New records are input to a table in the database 180 only when there is a change in one or more report variables required for the record. In this manner, processing resources and storage space required for the database 180 are reduced.

Please replace paragraph [0047], with the following amended paragraph:

[0047] The reports CGI module 155 is a module that generates reports and which is comprised within the web server 165. The reports CGI module 155 provides a user friendly, web page interface for generating MMD 20 reports on the connected machine's 15 status. When a user requests to view the reports available for a machine 15, the reports CGI module 155 generates a web page containing a menu of reports to view. The user may then select a report and enter the desired report parameters into the web page interface provided by the reports CGI module 155 to the CD 35 for the report selected. The parameters typically involve time intervals, referred to as shifts, for monitoring the machine 15 between a scheduled start and end time for workers or machines 15. The reports CGI module 155 then uses the parameters input by the user to generate an SQL query which is sent to the database manager 175. The database manager 175 executes the query to obtain the desired information from the database 180 and transmits the results to the reports CGI module ~~205~~ 155. The reports CGI module 155 uses this information to generate a web page containing the selected report which is transmitted to the user's CD 35. The contents and structure of the reports, which dictate the SQL queries, are output to the reports CGI module 155 by the configuration interface module 135 during initialization.

Please replace paragraph [0052], with the following amended paragraph:

[0052] It should be apparent to one skilled in the art that the placing of the input connectors 45 and/or output connectors 70, serial ports 60, network ports 80, engine 140, drivers 150, database system ~~140~~ 145, reporter module ~~145~~ 160, configuration interface module 135, and web server 165 has a positive cumulative effect on reliability and use of network 25 resources. All user configuration entries and displays, as well as report generation, are handled on-board via the web server 165, including the reports CGI module 155 and configuration CGI module 170, and reporter module 160. On-board storage of machine 15 report data is assured by the database system 145, comprised of the database manager 175 and database 180. All required hardware capabilities for processing for machine ~~20~~ 15 inputs and engine 140 outputs, as well as serial and network communications are also located within the MMD 20. For all of these functions, the MMD 20 constitutes a self-contained unit and acts as a server to the CDs 35 over the network 25 for, thereby eliminating the need for a central server elsewhere

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and increasing reliability. Since almost all MMD 20 data processing and interface generation is also handled within the MMD 20, network 25 traffic is also reduced.

Please replace paragraph [0064], with the following amended paragraph:

[0064]   Proceeding now to the machine information step 230, the user enters basic machine 15 and MMD 20 information via one or more web ~~pages~~ page user interfaces generated for this purpose by the configuration CGI module 170. This information includes, among other things: a device name to associate the MMD 20 with the machine 15 to which it is connected, system user names and corresponding passwords, whether the user desires that digital signals for alarms be inverted, IP address information if not already provided, and the IP address of a time server for providing time information. If desired, the user may also choose to import or export configuration information to/or from a file on the user's CD 35.

Please replace paragraph [0068], with the following amended paragraph:

[0068]   It is during the output configuration step 245 that the IP address of any MMD 20 designated to monitor the status of other MMDs 20 is entered. If such an address is entered and the user activates this monitoring feature, then, during initialization, the MMD 20 will send machine status information (such as whether the machine is running or not) and the MMDs 20 IP address to the designated MMD 20. Monitored MMDs 20 will only transmit new machine status information to the designated MMD 20 if there is a change in status. This information is used by the web server 165 of the designated MMD 20 node to allow the user to navigate from MMD 20 to MMD 20 in a list, such as a hierarchal tree, and view the reports and basic machine 15 running status of each MMD 20.

Please replace paragraph [0070], with the following amended paragraph:

[0070]   For certain reports and values, the user may specify whether the engine 140 should send e-mail notifications, as well as the recipients, frequency, and delays of such notifications. The user may also choose to have all reports automatically forwarded by the reporter module 160 to a CD 35 on the network 25 for archiving or use by another application.

Please replace paragraph [0075], with the following amended paragraph:

[0075]   Reference is now made to Figure 7, a flowchart of the reporting step 200 of Figure 4 for automated reports. This flowchart is shown generally as 280. The MMD 20 may automatically generate reports at certain time intervals, depending on whether this option is chosen during the configuration step 190. Beginning with the query generation step 285, the reporter module 160 generates an SQL query and transmits it to the database manager 175. Next, at the query processing step 290, the database manager 175 executes the query by interrogating the database 180 and transmits the result back to the reporter module 160. Finally, at the report output step 295, the reporter module 160 receives the query results, transforms them into one or more

reports in the format specified in the configuration information, and transmits the report over the network 25 to a CD 35. The report may be stored on the CD 35 for archival purposes and/or used by the user or other applications, such as factory/plant automation software.

Please replace paragraph [0076], with the following amended paragraph:

[0076] Figure 8 is a flowchart of the reporting step 200 of Figure 4 for user requested web page reports, shown generally as 300. Beginning with the web report request step 305, the user enters the IP address of the MMD 20 attached to the machine 15 the user wishes to view. The web server 165 then generates an initial web page user interface menu from which the user may choose to view reports or enter or view configuration information. The user selects the option to view reports and the reports CGI module 2̶0̶5̶ 155 generates a report selection web page user interface from which the user may choose a report to view. Next, at the web report selection step 310, the user selects a report from the web page report selection user interface menu. If the report selected requires that the user enter parameters for generating the report, the reports CGI module 155 generates a web page user interface for the desired report from which the user enters the required parameters. If, however, the report does not require e̶n̶t̶r̶y̶ ̶o̶f̶ ̶u̶s̶e̶ a user to enter parameters, or if default values for the report were specified during configuration, the parameter entry web page user interface will not be displayed and the reporting step will automatically to the next step. These scenarios are not shown in Figure 8. Next, at the web query generation step 315, the reports CGI module 155 generates an SQL query which is sent to the database manager 175. This query incorporates any parameters entered by the user during the web report selection step 310. Next, at the web query processing step 3̶3̶5̶ 320, the database manager 175 executes the query to obtain the desired information from the database 180 and transmits the results to the reports CGI module 2̶0̶5̶ 155. Finally, at the web report output step 325, the reports CGI module 155 uses the information returned by the database manager 175 to generate a web page containing the report which is transmitted to the user's CD 35.

Please replace paragraph [0077], with the following amended paragraph:

[0077] The reports CGI module 155 can constantly repeat the web query generation step 315, the web query processing step 320, and the web report output step 325 to capture and report changes in inputs and variables, as handled by the engine 140 and database manager 175. This allows the user to see the changes as they occur in real time. Also, as mentioned above, the user may specify during configuration that the reports CGI module 155 generate a series of default reports, using default parameters, that will appear as soon as the user types in the IP address of the MMD 20. In this scenario, not shown in Figure 9̶ 8, the web query generation step 3̶3̶0̶ 315, the web query processing step 3̶3̶5̶ 320, and the web report output step 3̶4̶0̶ 325 are automatically undertaken for the default reports and parameters as soon as the MMDs 20 IP address is entered. The result is that the initial web page user interface menu generated by the web server 165 will display the default reports, generated by the

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reports CGI module 155 with default parameters, along with the menu of available reports and configuration options. Any reports subsequently chosen from the reports menu which also have default parameters specified will also be automatically generated by the reports CGI module 155 with these parameters when selected. The user then has only to enter specific parameters for reports where there are no default parameters or when the user wishes to use different parameters.